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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,185	08/31/2004	William E. Bernier	FIS920040056US1	5184

29154 7590 10/06/2005

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EXAMINER

MATISLAK, JENNIFER E

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

EK

Office Action Summary	Application No. 10/711,185	Applicant(s) BERNIER ET AL.	
	Examiner Jennifer Matisiak	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 21-25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification lacks the necessary description of "micelle brushes" for a clear or even a reasonable understanding of this aspect of applicants' invention. Additionally, a research of the term "micelle brushes" reveals that the structure or material is not well known to the ordinary artisan.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3 & 5-7 rejected under 35 U.S.C. 102(e) as being anticipated by Hedler et al. (USPGPUB 2003/0201452), hereinafter Hedler.

Regarding claim 1, Fig. 1a of Hedler shows a laminated conductive interconnection for joining an integrated circuit device (MB) to a device carrier (C1), said conductive interconnection comprising: alternating metal layers (F) and polymer layer (K) between said integrated circuit device and said device carrier.

Regarding claim 3, Fig. 1a of Hedler shows a laminated conductive interconnection, wherein alternating metal layers and polymer layers comprise one of a cube-shaped structure and a cylinder-shaped structure (CC).

Regarding claim 5, Fig. 1a of Hedler shows a laminated conductive interconnection, wherein alternating metal and polymer layers are substantially perpendicular to device carrier and integrated circuit device (CC).

Regarding claim 6, Hedler teaches a laminated conductive interconnection, wherein polymer layers comprise a thermoplastic conductive adhesive [0004].

Regarding claim 7, Hedler teaches a laminated conductive interconnection wherein polymer layers comprise a thermoplastic conductive adhesive [0004].

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 8-10 & 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Wark et al. (US 6,613,662), hereinafter Wark.

Regarding claim 8, Fig. 1B of Wark shows a conductive interconnection, (30), for joining an integrated circuit device (14) to a device carrier (29) said conductive interconnection comprising: a polymer having a spherical shape (12 col 2 lines 13-15 col 13 lines 45-54) between said integrated circuit device and said device carrier; and metal projections (24) extending from at least one of said integrated circuit device and carrier, wherein said metal projections extend partially into said polymer.

Regarding claim 9, Wark shows in Fig. 1B a conductive interconnection wherein metal projections have a triangular shape in cross-section (col 4 lines 31-34).

Regarding claim 10, Fig. 6A, B of Wark shows a conductive interconnection wherein metal projections have a cone-shape (48).

Regarding claim 12, Wark inherently discloses, "wherein said polymer includes metal particles," since it is well known in the art that a polymer include metal particles in order to be conductive.

Regarding claim 13, Wark inherently discloses, "wherein said polymer comprises a thermoset polymer," since it is well known in the art that a conductive polymer interconnect comprise a thermoset polymer in order to be a rigid interconnect structure.

Regarding claim 14, Wark inherently discloses, "wherein said polymer comprises a thermoplastic conductive adhesive," since it is well known in the art that a conductive polymer interconnect comprise a thermoplastic polymer in order to be a malleable interconnect structure.

Claims 15-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Ball et al. (US 6186392), hereinafter Ball.

Regarding claim 15, Fig. 5J of Ball shows a conductive interconnection (48B) for joining an integrated circuit device (Fig. 5C) to a device carrier (46) said conductive interconnection comprising: a polymer (92) having a spherical shape between said integrated circuit device and device carrier; and dendrites (84 col 7 line 56) within the polymer.

Regarding claim 16, Fig. 5J of Ball teaches a conductive interconnection (48B) wherein said dendrites (84) comprise a plated coating on a conductive material.

Regarding claim 17, Fig. 5J of Ball shows a conductive interconnection (48B) wherein said dendrites (84) have an irregular pattern within said polymer (92).

Regarding claim 18, Ball teaches a conductive interconnection wherein said polymer includes metal particles (col 2 lines 41-43).

Regarding claim 19, Ball teaches a conductive interconnection wherein said polymer comprises a thermoset polymer (col 7 lines 19-21).

Regarding claim 20, Ball teaches a conductive interconnection wherein said polymer comprises a thermoplastic conductive adhesive (col 7 lines 19-21).

Regarding claim 21, as best the examiner is able to ascertain the claimed and disclosed invention, Fig. 5J of Ball shows a conductive interconnection (48B), for joining an integrated circuit device (see Fig. 5C) to a device carrier (46) said conductive interconnection comprising: a polymer having a spherical shape between said integrated circuit device, and said device carrier; and micelle brushes (50) on the outer

surface of said polymer (92) wherein a first end of said micelle brushes, readable as the surface of 50 in contact with the polymer, has an affinity for said polymer and a second end of said micelle brushes has an affinity for said integrated circuit device (see Fig. 5C) and said device carrier (46).

Regarding claim 22, Fig. 5J of Ball shows a conductive interconnection (84B) wherein said micelle brushes (50) comprise a reactive moiety with an organic tail.

Regarding claim 23, Ball teaches a conductive interconnection wherein said polymer includes metal particles (col 2 lines 41-43).

Regarding claim 24, Ball teaches a conductive interconnection wherein said polymer comprises a thermoset polymer (col 7 lines 19-21).

Regarding claim 25, Ball teaches a conductive interconnection wherein said polymer comprises a thermoplastic conductive adhesive (col 7 lines 19-21).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 & 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hedler, as applied to claim 1 above, in view of Perry et al. (US 633104), hereinafter Perry.

Regarding claim 2, the difference between Hedler and the claimed invention is "wherein said polymer layers include metal particles." Perry teaches conductive polymers that include metal particles (col 5 lines 3-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hedler by including metal particles in the polymer layer. The ordinary artisan would have been motivated to modify Hedler in the manner described above for at least the present purpose by making all the components of said interconnect polymer of Hedler conductive.

Regarding claim 4, Hedler does not disclose "wherein said alternating metal layers and polymer layers are substantially parallel to said device carrier and said integrated circuit device." However, Fig. 5c of Perry shows a conductive polymer interconnection (30) that is substantially parallel to device carrier (72) and integrated circuit device (62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hedler by having a laminated conductive interconnection wherein alternating metal layers and polymer layers are substantially parallel to said device carrier and said integrated circuit device in order to reduce the width of the interconnect and to allow for more interconnects. Such modification to Hedler would also include metal particles in the polymer layer (K) to make the interconnection conductive.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wark, as applied to claim 8 above.

Regarding claim 11, the difference between Wark and the claimed invention is "wherein said projections extend from both said integrated device and said device carrier." Wark teaches the use of metal projections extending from a device carrier into a conductive interconnection having a spherical shape in order to reduce deformation to said interconnection (col 3 lines 54-57). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Wark such that metal projections extend from both a device carrier and an integrated circuit device into a conductive interconnection having a spherical shape in order to further reduce deformation to said interconnection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Matisiak whose telephone number is 571-272-2639. The examiner can normally be reached on Business Days 8:30a-5:30p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 517-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Eddie Lee', is positioned above the printed name and title.

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800